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YOUNG FOLKS PROGRAM. Fri., Oct. 28/27

No. 4. The Blood of the Big Bear.

ANNOUNCEMENT: There's Uncle Abe and his nephew Jim again. You know, Uncle Abe is from the Department of Agriculture. He knows a lot about plants and animals. Jim is always hanging around him to get him to tell a story. But what is that they are doing now? They've got some paper, and paints -- and yes, I believe they are looking at some Autumn leaves. I wonder what they are doing? Let's get over closer and find out ---

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UNCLE ABE: This will make a great scrap book, Jim, You can make the prints of the leaves on the paper here. Then you can put down the name of the tree from which the leaf came. Then you can write a little description of the tree. You'll know a lot about trees.

JIM: Here's an extra pretty leaf, Uncle Abe.

UNCLE ABE: All right, we'll make a print of that one. First, you see, we mix these oil paints to match the colors of the leaf here you want to print. Now then, we put the colors on the under side of the leaf. You see, I'm copying the exact colors from the brighter, upper side. You have to do this work fast, so the first colors you put on won't dry before you get on the last ones.

Watch here now. You see we put the leaf with the vein or painted side down on this sheet of white paper. Then we put another sheet of paper on top of it. You have to be careful. Don't let the leaf slip or it will smear. Now you see you rub the top sheet hard with the fingers. Take up the top sheet of paper and the leaf. There you are! There you have a copy of the form and colors of the original leaf. You could make black and white leaf prints by using ink instead of paint. Of course, they won't be as beautiful as one like this made in colors. Do you know why leaves change color, Jim?

JIM: The frost does it, doesn't it?

UNCLE ABE: No. Some of the leaves begin to turn before we have any frosts. No, you can't blame Jack Frost for it.

JIM: What does make leaves red and yellow?

UNCLE ABE: Well, the Indians used to say it was the spirits hunting through the sky. According to their story, the sky hunters killed the Great Bear. They claimed that the blood of the Great Bear dripping on the forests changed many trees to red.

JIM: How about the yellow leaves?

UNCLE ABE: They were turned yellow by the fat which spattered out of the kettle as the hunters cooked the meat.

JIM: What really makes leaves change color?

UNCLE ABE: In reality, the change of coloring is due to chemical processes which take place in the tree. The change is a preparation for winter.

JIM: How you mean, "chemical processes"?

UNCLE ABE: Well, you know, the green leaves are really the tree's food factories. All during the spring and summer, they were busy making the food necessary for the tree to grow. Numberless tiny green cells really give the leaf its green color and in them the food making takes place.

JIM: What do they make the food out of?

UNCLE ABE: They make the food by combining simpler things with which they are supplied by the air and by the water which the roots gather. From the carbonic acid gas in the air they take carbon. They combine the carbon with hydrogen, oxygen, and various minerals supplied by the water brought to them through the roots of the tree.

JIM: That's not telling me what makes the leaves change color?

UNCLE ABE: Just a minute. I'm coming to that --- In the fall cool weather slows down the tree's growth and activity. The demand for tree food is reduced, so the food factories in the leaves shut down for lack of business. The machinery of the leaf factory is dismantled, so to speak. The green bodies are broken up. Whatever food there is on hand is sent to the body of the tree to be stored up for use in the spring. All that is left in the cell cavities of the leaf is a watery substance in which can be seen a few tiny oil drops and crystals and a few yellow bodies which give the leaves that yellow coloring you see in those autumn leaves there.

JIM: But how about the red leaves; those with the drippings of blood from the Big Bear?

UNCLE ABE: Well, it often happens that there is more sugar in the leaf than can be shipped back to the tree for storage. When this is the case, the chemical combination with the other substances produces many colored tints. Tints like those there, and there, and there. Tints varying from the brilliant red of the dogwood to the duller red-browns of the oaks. You've noticed how in cone-bearing trees which do not lose their leaves or

needles in the fall, the green coloring matter takes on a slightly brownish tinge. Next spring that brownish tinge will give way to lighter green.

While the leaf is changing its color, other things are going on. Right where the stem of the leaf is attached to the tree, a special layer develops which gradually cuts the tissues that hold the leaf. At the same time, Nature heals the cut, so that when the leaf is finally blown off by the wind or falls from its own weight, the place where it grew on the twig is marked by a scar.

JIM: Why do the leaves have to fall off anyway, Uncle Abe?

UNCLE ABE: Well, Jim, did you ever see the branches of trees all loaded down with ice and snow. I've seen trees broken down by the weight. If the broadleaves stayed on the tree, they'd collect too much snow. The broadleaf trees of the north shed their leaves so that their branches will more easily bear the winter's weight of snow and ice. Some trees that shed their leaves in the north are practically evergreen in the southern States. The pines, spruces, cedars, firs, and hemlocks have no definite time for leaf shedding. Their leaves are either needle or scale-like. They are better suited for shedding snow than the broadleaf trees.

But here's something about autumn leaves you won't want to forget. It's important for all of us to know. As I said awhile ago, the food prepared in the leaves is sent back to the trees. But during the summer months, the walls of the food factories in the leaves are filled with mineral substances which do not get back to the tree. So, you see, when the leaves fall they still contain valuable substances.

JIM: What?

UNCLE ABE: Nitrogen and phosphorus for instance which the tree took from the soil. Such minerals are important plant foods. So when the leaves fall and gradually go to pieces, they make the top layer of the soil richer by returning these things to the soil. That is why the mellow black earth from the forest floor is so fertile. But if fires run through the forest and burn the leaves, the most valuable of these plants foods in the leaves are changed by the heat into gases and escape into the air. So you see, forests which are burned over regularly soon lose their soil fertility, even if there doesn't seem to be any damage done to the standing timber.

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